

WATER UTILITIES  
STANDARD DETAILS

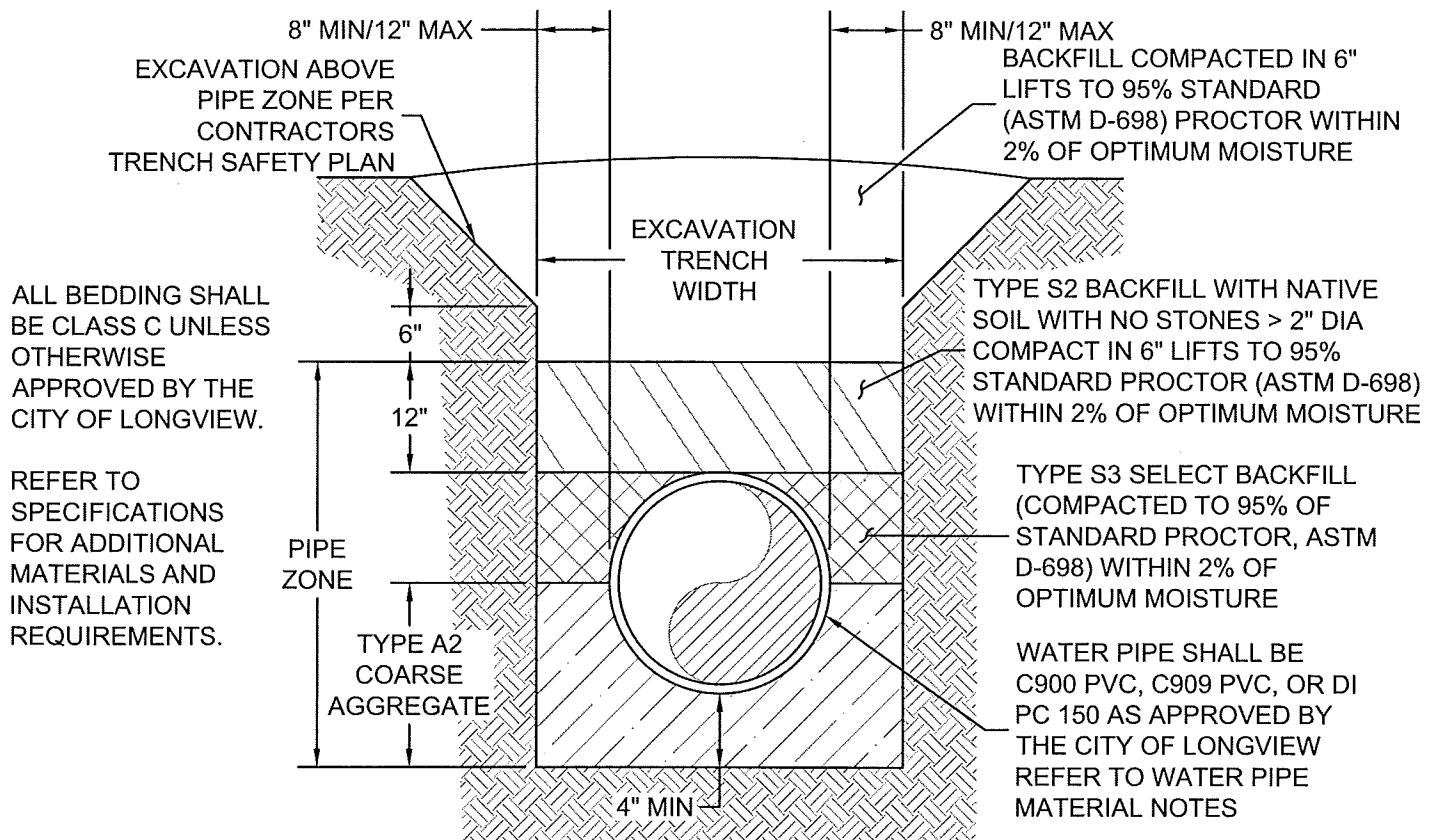
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WATER UTILITIES  
STANDARD DETAILS

PREFACE HERE

## WATER UTILITIES DETAILS

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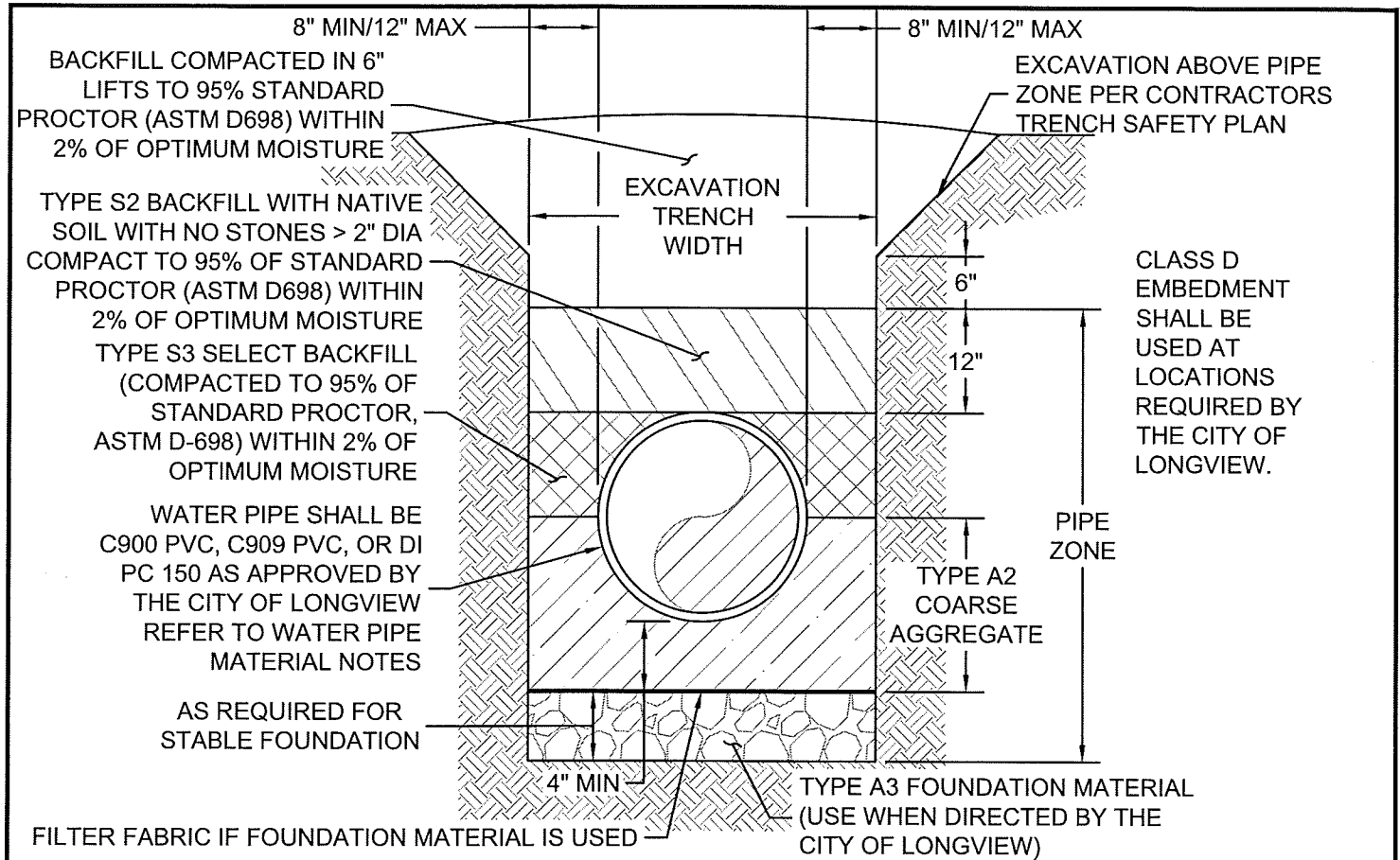


TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

#### GENERAL NOTES:

1. PIPE AND FITTINGS SHALL BE INSTALLED AND TESTED PER AWWA C600 OR C605 AS APPLICABLE.
2. WATER LINES SHALL BE DISINFECTED AND TESTED PER AWWA C651. TEST RESULTS SHALL BE SUBMITTED TO THE CITY OF LONGVIEW.
3. ALL BELOW GRADE FITTINGS SHALL BE DIMJ WITH RETAINING GLANDS AND THRUST BLOCKING.
4. PROVIDED AND INSTALL ADDED RESTRAINT AND USING SS ALL-THREADS AT LOCATIONS DESIGNATED BY THE CITY OF LONGVIEW.
5. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE INSTALLATION CLASS C EMBEDMENT
	LATEST REVISION: 3/20/2018		



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TYPE A3	COARSE STONE OR CRUSHED GRAVEL. FOUNDATION MATERIAL SHALL BE PIT RUN ANGULAR CRUSHED, NATURAL WASHED STONE FREE OF SHALE, CLAY, FRIABLE MATERIAL AND DEBRIS; WELL GRADED BETWEEN 1" AND 3" IN SIZE, WITH A MINIMUM OF 90% RETAINED ON A 1" SIEVE.
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- PROVIDED AND INSTALL ADDED RESTRAINT USING SS AND ALL-THREADS AT LOCATIONS DESIGNATED BY THE CITY OF LONGVIEW.
- ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

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	LATEST REVISION: 3/20/2018	STANDARD DETAILS	CLASS D EMBEDMENT

WATER PIPE MATERIAL DETAIL NOTES:

A. DUCTILE IRON WATER PIPE

1. ALL DUCTILE IRON WATER PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C150/A21.50 AND ANSI/AWWA C151/A21.51.
2. DUCTILE IRON WATER PIPE SHALL BE AT LEAST PRESSURE CLASS 150.
3. ALL PIPES SHALL BEAR THE NSF SEAL OF APPROVAL.
4. INTERIOR SURFACES SHALL BE CEMENT LINED PER AWWA C104.
5. EXTERIOR SURFACES SHALL BE COATED WITH BITUMINOUS COATING PER AWWA C110.
6. PIPE SHALL BE FREE FROM EXCESSIVE PITS, SCARS, OR OTHER SURFACE DEFECTS.
7. JOINTS SHALL BE INTEGRAL BELL WITH FLEXIBLE ELASTOMERIC SEAL PER AWWA C111.
8. ALL WATERLINES SHALL BE INSTALLED WITH TRACER WIRE.
9. ALL DUCTILE IRON PIPE, FITTINGS, AND APPURTENANCES SHALL BE WRAPPED IN EIGHT MIL POLYETHYLENE AND TAPE ENCASEMENT PER AWWA C105.

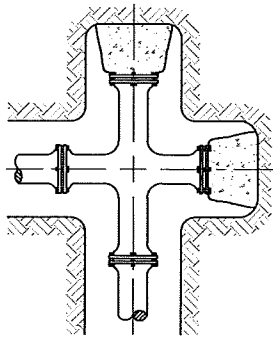
B. PVC WATER PIPE

1. AWWA C900 AND AWWA C905 PIPE FOUR INCHES AND LARGER IN DIAMETER SHALL BE DR 18 PRESSURE CLASS 235.
2. AWWA C909 PIPE SHALL BE PRESSURE CLASS 235.
3. PIPE LESS THAN FOUR INCHES IN DIAMETER SHALL BE TYPE 1, GRADE 1, POLYVINYL CHLORIDE, SCHEDULE 40 PIPE CONFORMING TO ASTM D1785.
4. BLUE PIPE SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
5. ALL PIPE SHALL BEAR THE NSF SEAL OF APPROVAL.
6. FOR PIPE TWO INCHES AND LARGER IN DIAMETER, THE JOINTS SHALL BE INTEGRAL BELL WITH A FLEXIBLE ELASTOMERIC SEAL. FOR PIPE SMALLER THAN TWO INCHES IN DIAMETER, JOINTS SHALL BE GLUED.
7. PIPE SHALL BE FREE OF EXCESSIVE PITS, SCARS, OR OTHER SURFACE DEFECTS
8. JOINTS SHALL BE INTEGRAL BELL WITH FLEXIBLE ELASTOMERIC SEAL PER AWWA STANDARDS
9. ALL PVC LINES SHALL BE INSTALLED WITH TRACER WIRE.

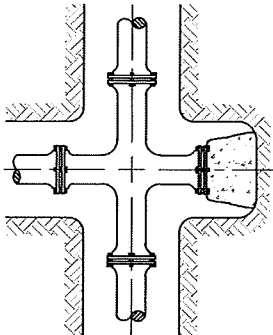
C. RESTRAINED JOINT PVC WATER PIPE

1. PIPE SHALL BE DR 18 PRESSURE CLASS 235.
2. ALL PIPE SHALL BEAR THE NSF SEAL OF APPROVAL.
3. THE RESTRAINED JOINT PIPE SYSTEM SHALL MEET ALL SHORT AND LONG TERM PRESSURE TEST REQUIREMENTS OF AWWA C900 AND C905.
4. PIPE AND COUPLING SHALL BE MADE FROM UNPLASTICIZED PVC COMPOUNDS HAVING A MINIMUM CELL CLASSIFICATION OF 12454-B AS DEFINED IN ASTM D1784.
5. THE COMPOUND SHALL QUALIFY FOR A HYDROSTATIC DESIGN BASE OF 4000 PSI OF WATER AT 73.4° F IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D2837.
6. BLUE PIPE SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
7. RESTRAINED JOINT PVC PIPE PRODUCTS SHALL HAVE BEEN TESTED AND APPROVED BY AN INDEPENDENT THIRD-PARTY LABORATORY FOR CONTINUOUS USE AT RATED PRESSURES.
  - a. COPIES OF AGENCY APPROVAL REPORTS OR PRODUCT LISTING SHALL BE PROVIDED TO THE CITY OF LONGVIEW IF REQUESTED.
  - b. PRODUCTS INTENDED FOR CONTACT WITH POTABLE WATER SHALL BE EVALUATED, TESTED, AND CERTIFIED FOR CONFORMANCE WITH NSF STANDARD 61 OR THE HEALTH EFFECTS PORTION OF NSF STANDARD 14 BY AN ACCEPTABLE CERTIFYING ORGANIZATION WHEN REQUIRED BY THE REGULATORY AUTHORITY HAVING JURISDICTION.
8. PIPE SHALL BE JOINED USING NON-METALLIC COUPLINGS WHICH, TOGETHER, HAVE BEEN DESIGNED AS AN INTEGRAL SYSTEM FOR MAXIMUM RELIABILITY AND INTERCHANGEABILITY.
  - a. HIGH-STRENGTH FLEXIBLE THERMOPLASTIC SPLINES SHALL BE INSERTED INTO MATING PRECISION-MACHINED GROOVES IN THE PIPE AND COUPLING TO PROVIDE FULL 360° RESTRAINT WITH EVENLY DISTRIBUTED LOADING.
  - b. MJ GLAND ADAPTERS SHALL BE USED TO ANCHOR THIS RESTRAINED-JOINT PVC PIPE TO DUCTILE IRON ACCESSORIES SUCH AS FITTINGS AND VALVES.
  - c. COUPLINGS SHALL BE DESIGNED FOR USE AT THE RATED PRESSURES OF THE PIPE WITH WHICH THEY ARE UTILIZED AND SHALL INCORPORATE TWIN ELASTOMERIC SEALING GASKETS MEETING THE REQUIREMENTS OF ASTM F477.
  - d. JOINTS SHALL BE DESIGNED TO MEET THE LEAKAGE TEST REQUIREMENTS OF ASTM D3139.
9. ALL PVC LINES SHALL BE INSTALLED WITH TRACER WIRE.

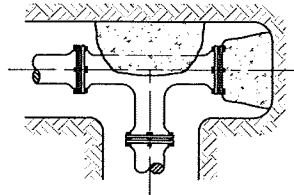
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	LATEST REVISION: 3/20/2018		



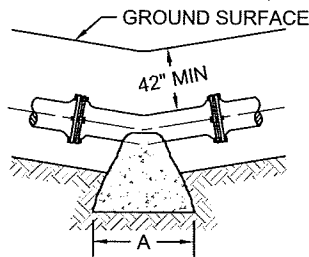
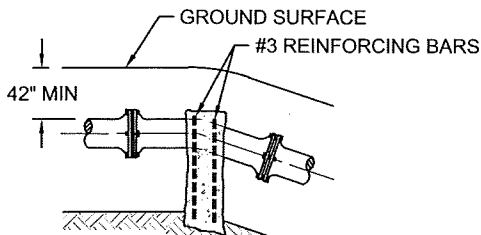
TYPICAL SECTION OF CROSS AND 2 PLUG  
BLOCKING  
(WHEN DIRECTED BY CITY OF LONGVIEW)



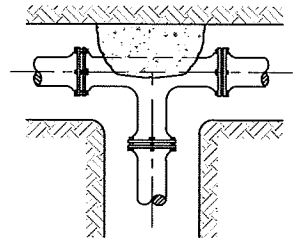
TYPICAL SECTION OF CROSS AND BLOCKING  
(WHEN DIRECTED BY CITY OF LONGVIEW)



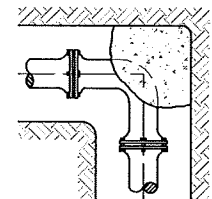
SPECIAL BLOCKING FOR TEE WITH PLUG  
(WHEN DIRECTED BY CITY OF LONGVIEW)



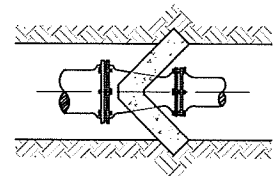
TYPICAL BLOCKING FOR  
VERTICAL BENDS



BLOCKING FOR TEE



TYPICAL BLOCKING FOR  
HORIZONTAL BENDS



THRUST SUPPORT FOR REDUCER CONNECTION  
(SIZE TO BE DETERMINED BY CITY OF LONGVIEW)

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THRUST BLOCKING  
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**NOTES ON THRUST BLOCKING:**

1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
2. THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE.
3. VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS PER CU FT FOR CONCRETE AND SOIL AT 120 LBS PER CU FT OVER THE AREA OF BLOCK.
4. VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 3,000 LBS PER SQ FT ALLOWABLE SOIL BEARING PRESSURE. DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE CITY OF LONGVIEW OR MEASURED SOIL CONDITIONS. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.
5. THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 2,400 LBS PER SQ FT OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL. BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE CITY OF LONGVIEW OR MEASURED SOIL CONDITIONS. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.
6. ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF TWO FEET.

7. ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.
8. ANCHOR COLLARS SHALL BE REINFORCED IN ACCORDANCE WITH REINFORCING BAR SCHEDULE FOR REDUCED BLOCKS SHOWN ABOVE. STEEL ANCHOR RING IN ACCORDANCE WITH DIMENSIONS OF ANCHOR COLLAR.

PIPE SIZE	TEES	BENDS			REDUCER		
	THRUST BLOCKING REQ'D (SF)	90° THRUST BLOCKING REQ'D (SF)	45° THRUST BLOCKING REQ'D (SF)	22 1/2° THRUST BLOCKING REQ'D (SF)	PIPE SIZE (IN)	ANGLE (THETA)	THRUST BLOCKING REQ'D (SF)
2 1/2"	0.61	0.43	0.23	0.12	4 - 3	8.2	0.05
3"	0.88	0.62	0.34	0.17	6 - 3	19.5	0.45
4"	1.57	1.11	0.60	0.31	6 - 4	12.8	0.22
6"	3.53	2.50	1.35	0.69	8 - 6	10.5	0.25
8"	6.28	4.44	2.40	1.23	10 - 8	9.6	0.30
10"	9.82	6.94	3.76	1.92	12 - 10	8.2	0.31
12"	14.14	10.00	5.41	2.76	14 - 12	7.2	0.32
14"	19.24	13.61	7.36	3.75	18 - 12	18.4	2.83
16"	25.13	17.77	9.62	4.90	20 - 14	17.5	3.04
18"	31.81	22.49	12.17	6.21	20 - 16	11.5	1.42
20"	39.27	27.77	15.03	7.66	24 - 18	14.5	3.12
24"	56.55	39.99	21.64	11.03	24 - 20	9.6	1.44
30"	88.36	62.48	33.81	17.24	30 - 20	19.5	8.30
36"	127.23	89.97	48.69	24.82	30 - 24	11.5	3.20

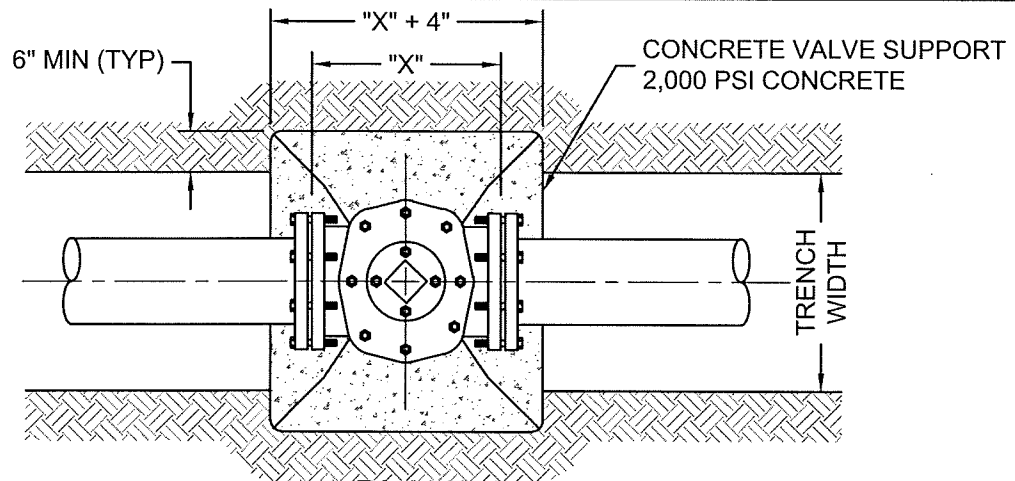
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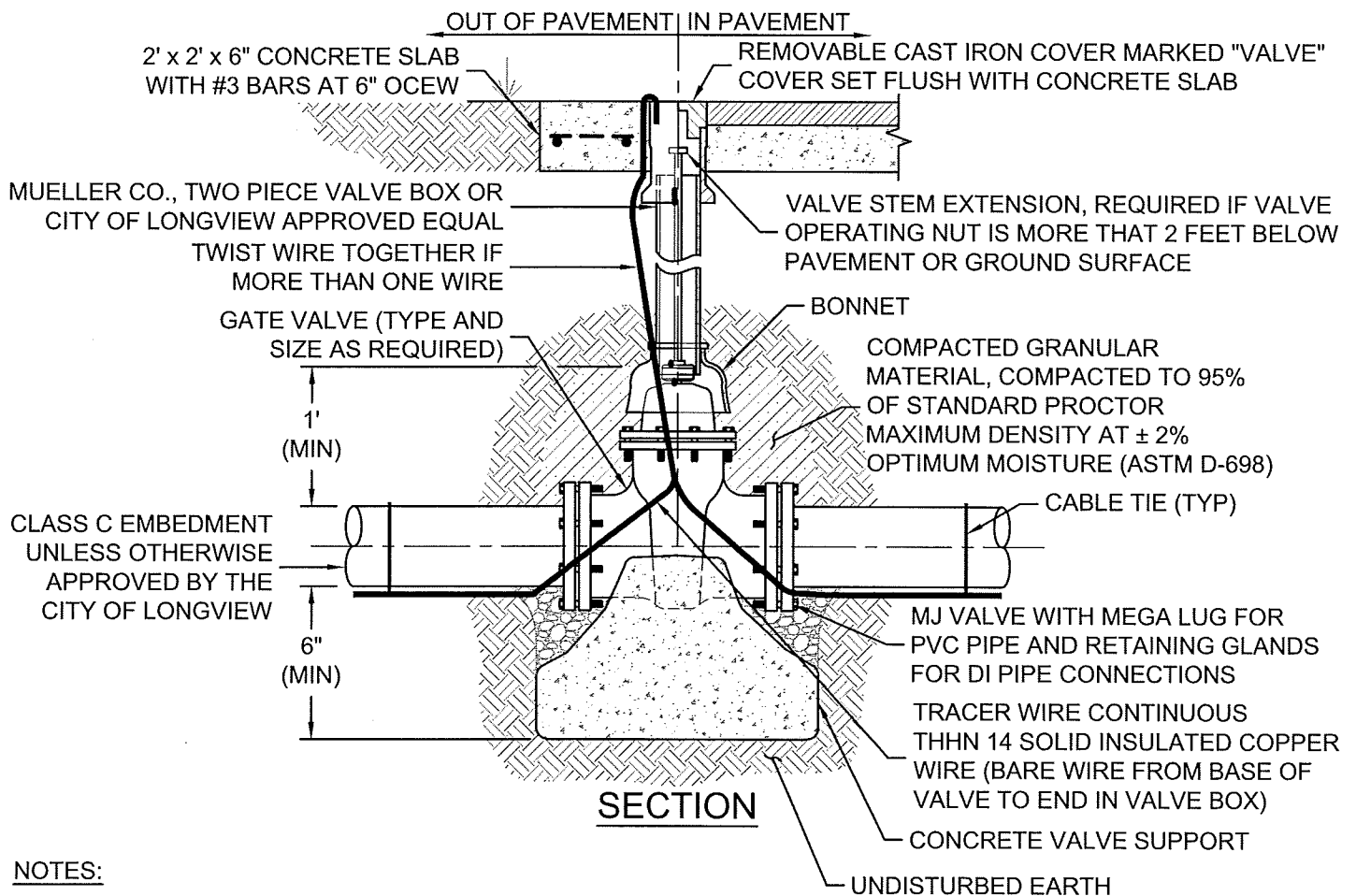
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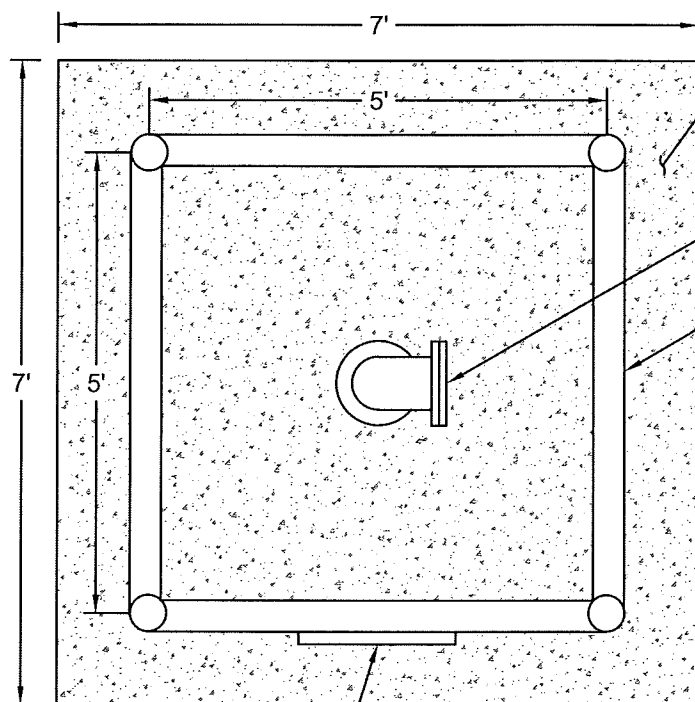
**PLAN**



**NOTES:**

1. DRAWING PERTAINS TO ALL GATE VALVES SIZES 4" THRU 12".
2. IN UNPAVED AREAS, INSTALL 2' x 2' x 6" CONCRETE VALVE PAD FLUSH WITH TOP OF VALVE BOX, REINFORCE WITH #3 BARS AT 6" OCEW.
3. INSTALL TRACER WIRE WITH CABLE TIES MAXIMUM 50 FEET SPACING BETWEEN TIES.

	<p>WATER</p> <p>LATEST REVISION: 3/20/2018</p>	<p>CITY OF LONGVIEW, TEXAS STANDARD DETAILS</p>	<p>WATER VALVE ASSEMBLY</p>
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**PLAN VIEW**

INSTALL BLOW OFF  
VALVE MARKER ON  
PIPE RAIL FENCE  
WITH STAINLESS  
STEEL U-BOLTS,  
WASHERS, AND NUTS

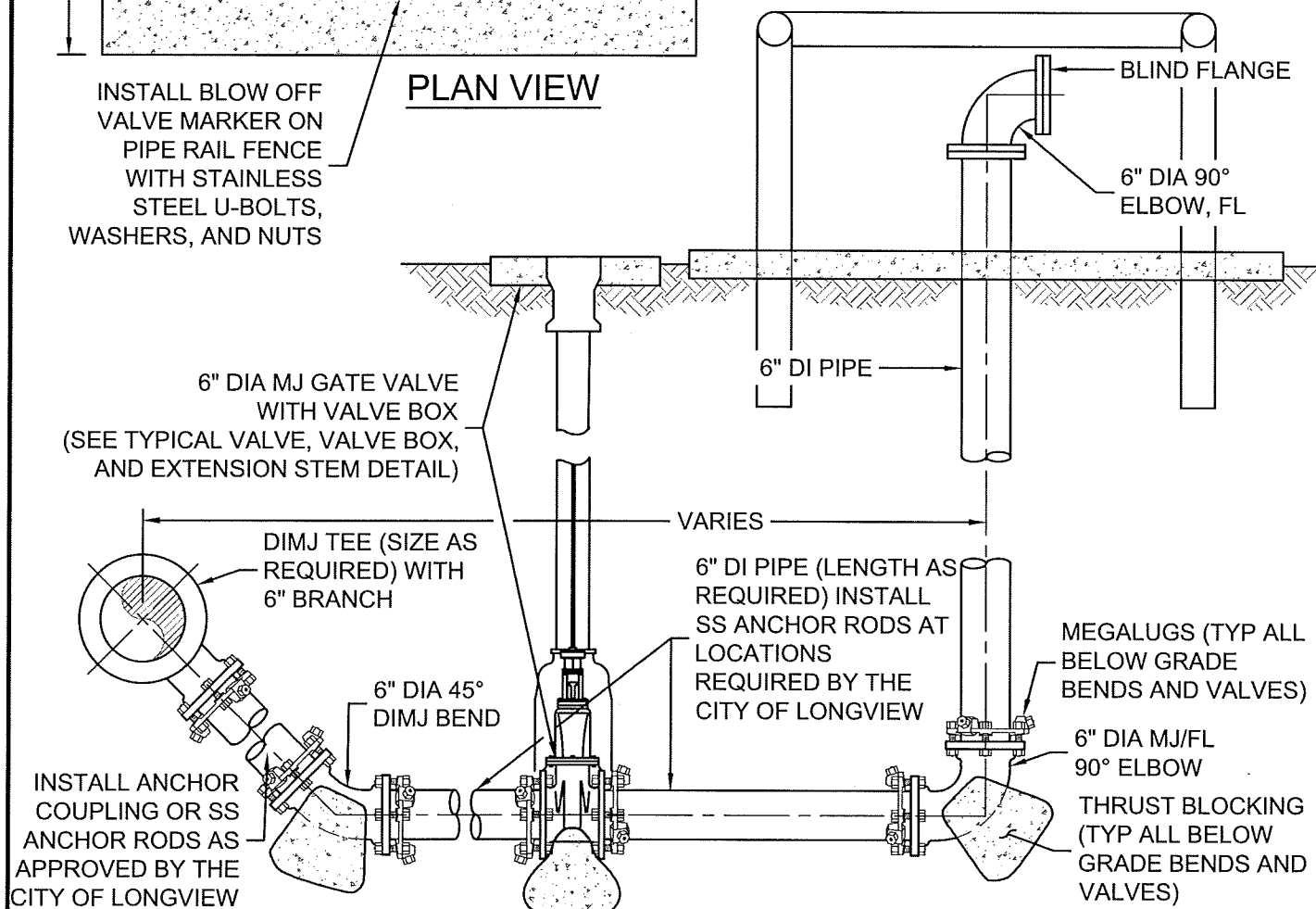
7' x 7' x 4" CONCRETE PAD (3,000 PSI CONCRETE  
REINFORCED WITH #3 @ 18" OCEW)  
SLOPE PAD 1/2"/FT IN ALL DIRECTIONS FROM  
HIGH POINT AT CENTER OF PAD  
SUBGRADE BELOW CONCRETE SHALL BE  
COMPACTED TO 95% OF STANDARD PROCTOR  
WITHIN  $\pm 2\%$  OF OPTIMAL MOISTURE

ORIENT BLOW OFF IN DIRECTION  
REQUIRED BY CITY OF LONGVIEW

3" DIAMETER SCH 20 STEEL PIPE RAIL FENCE  
PRIME AND PAINT COLOR AS REQUIRED BY  
THE CITY OF LONGVIEW

**NOTES:**

1. PAINT ALL POSTS AND BRACES FIRST COAT:  
TNEMEC SERIES 27 - 2 - 3 dFT MILS SECOND  
COAT: TNEMEC SERIES 1074/1075 - 3 - 5 dFT  
MILS
2. PIPE BLOW OFF TO LOCATION AS REQUIRED  
BY CITY OF LONGVIEW.

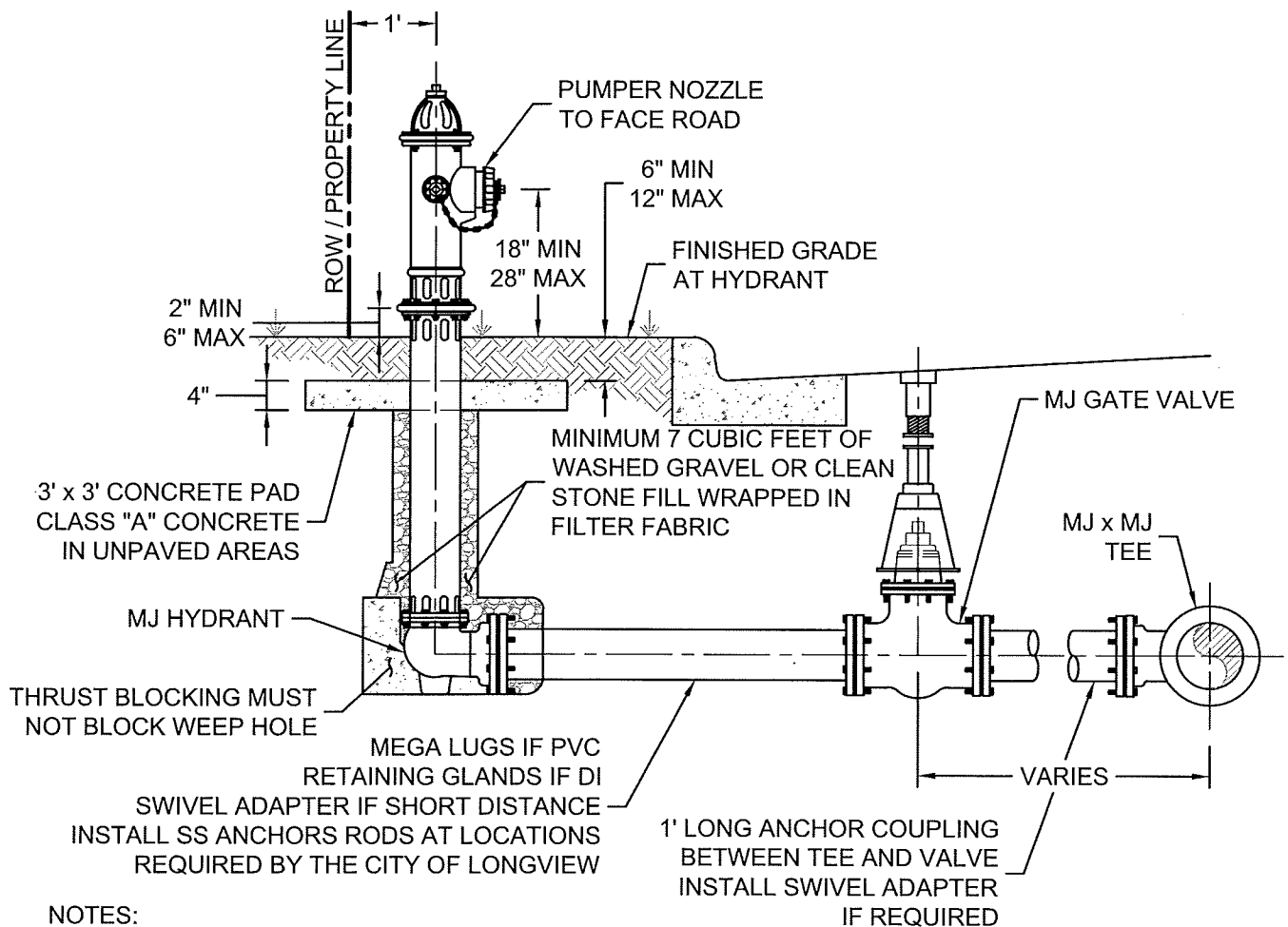


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**CITY OF LONGVIEW, TEXAS  
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**BLOW OFF ASSEMBLY**



**NOTES:**

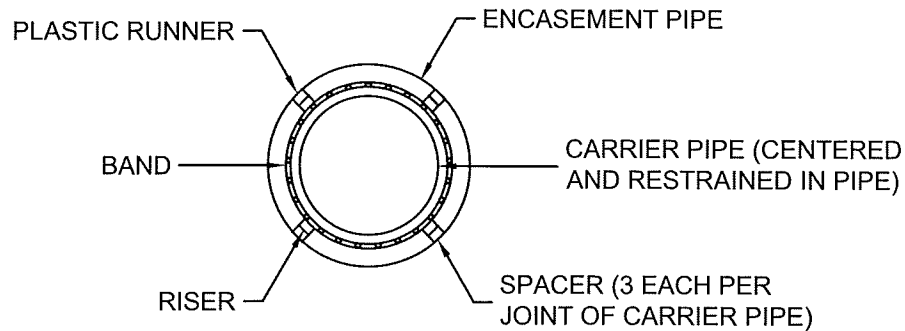
1. CITY OF LONGVIEW ACCEPTABLE FIRE HYDRANTS ASSEMBLIES AREA AS FOLLOWS: MUELLER A-423, AMERICAN DARLING B84 Btc, OR CLOW-MEDALLION.
2. ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502.
3. TYPICAL VALVE: ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
4. STANDARD BURY DEPTH 4' FEET.
5. SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.
6. FIRE HYDRANTS SHALL BE YELLOW IN COLOR.
7. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION

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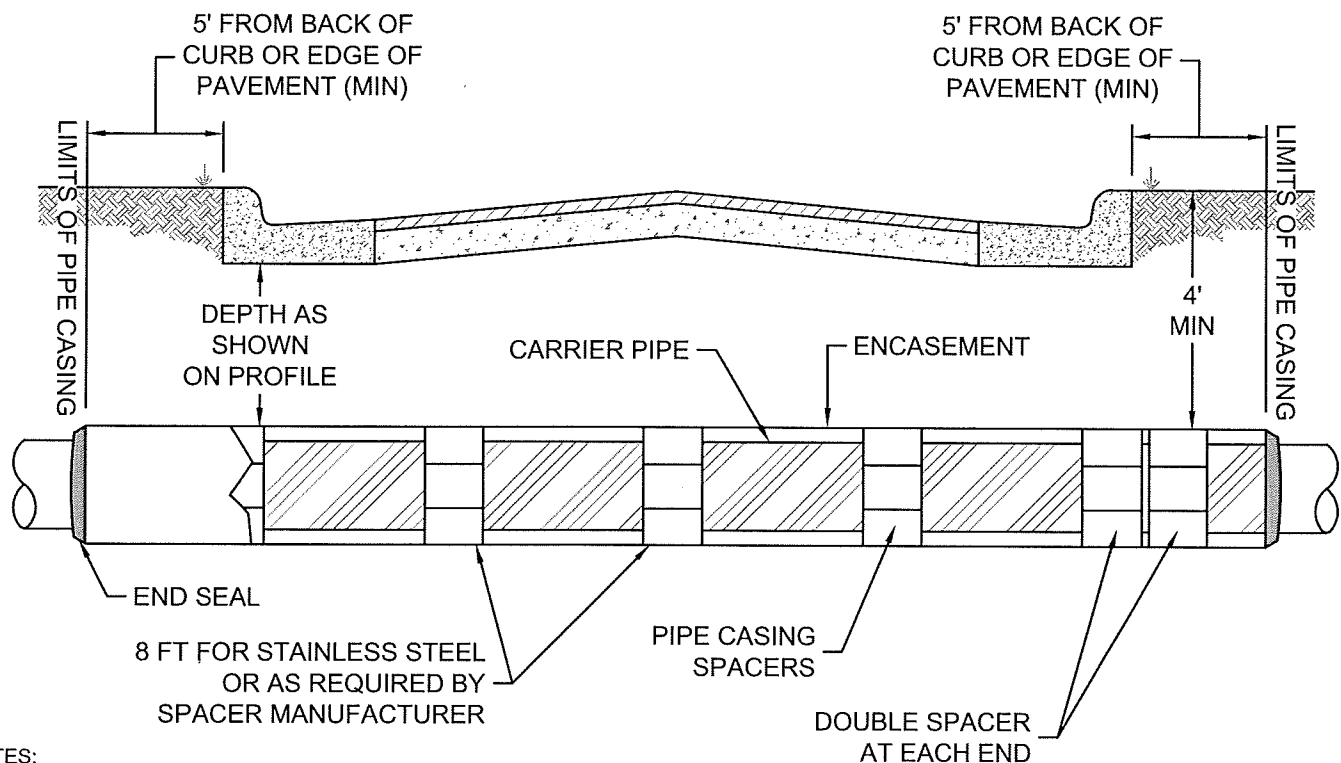
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FIRE HYDRANT ASSEMBLY



## PIPE CASING SPACER



### NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO PIPE CASING DETAIL NOTES AND SPECIFICATIONS.
2. CASING SPACERS SHALL BE STAINLESS STEEL.
3. CASING SPACERS SHALL CENTER AND RESTRAIN CARRIER PIPE IN CASING.
4. CASING END SEALS SHALL BE "PULLON" TYPE, "WRAP AROUND" END SEALS ARE PROHIBITED.
5. FOR NEW ROAD CONSTRUCTION, INSTALL CASING BY OPEN CUT PRIOR TO ROAD CONSTRUCTION. INSTALL CLASS C PIPE EMBEDMENT AND BACKFILL CASING TRENCH PER CLASS C EMBEDMENT DETAIL.
6. FOR CONSTRUCTION AT EXISTING ROADS, INSTALL BE DRY BORE UNLESS APPROVED OTHERWISE BY THE CITY OF LONGVIEW.
7. LATERAL AND VERTICAL VARIATION IN THE FINAL POSITION OF THE PIPE CASING OR TUNNEL LINER FROM THE LINE AND GRADE ESTABLISHED BY THE CITY OF LONGVIEW SHALL BE ACCEPTABLE ONLY TO THE EXTENT THAT IT DOES NOT IMPACT THE LINE AND GRADE OF THE CARRIER PIPE. IF IN THE CITY OF LONGVIEW'S OPINION, THE COMPLETED INSTALLATION DOES NOT MEET THE INTENT OF THE DESIGN, THE WORK SHALL NOT BE CONSIDERED ACCEPTABLE AND SHALL BE REPLACED.

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PIPE CASING  
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PIPE CASING DETAIL NOTES:

MATERIALS:

A. STEEL PIPE:

1. STEEL CASING PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
2. STEEL CASING PIPE TO BE INSTALLED WITH UNION PACIFIC RAILROAD RIGHT-OF-WAY SHALL BE COATED WITH COAL TAR EPOXY MEETING THE REQUIREMENTS OF CORP OF ENGINEERS SPECIFICATIONS C-200A. COAL TAR EPOXY SHALL BE INSTALLED IN TWO COATS FOR A TOTAL DFT OF 16 MILS. WELDED JOINTS SHALL BE FIELD COATED. ALL OTHER CASING INSTALLED OUTSIDE OF UNION PACIFIC RAILROAD RIGHT-OF-WAY MAY BE UNCOATED.
3. CASING SHALL MEET ASTM A-36, ASTM A-570, ASTM A-135, ASTM A-139, OR CITY OF LONGVIEW APPROVED EQUAL.
4. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA C-206.
5. UNLESS SPECIFIED OTHERWISE, THE MINIMUM WALL THICKNESS OF STEEL CASING PIPE SHALL BE AS FOLLOWS:

<u>CASING DIAMETER</u>	<u>WALL THICKNESS</u>
<12"	0.25"
13" - 18"	0.25"
19" - 22"	0.25"
23" - 28"	0.4375"
29" - 34"	0.50"
35" - 42"	0.5625"
43" - 48"	0.625"

B. CASING INSULATORS:

1. USE CASING INSULATORS FOR ALL TYPES OF CARRIER PIPE.
2. INSULATORS SHALL CONSIST OF PRE-MANUFACTURED STEEL BANDS WITH PLASTIC LINING AND PLASTIC RUNNERS.
3. INSULATORS SHALL FIT SNUG OVER THE CARRIER PIPE AND POSITION THE CARRIER PIPE APPROXIMATELY IN THE CENTER OF THE CASING PIPE, TO PROVIDE ADEQUATE CLEARANCE BETWEEN THE CARRIER PIPE BELL AND THE CASING PIPE.
4. FASTENERS FOR INSULATORS SHALL BE STAINLESS STEEL.
5. INSULATORS SHALL BE AS MANUFACTURED BY ADVANCE PRODUCT AND SYSTEMS, INC., MODEL #SSI, OR CITY OF LONGVIEW APPROVED EQUAL.

C. END SEALS:

1. ALL CASINGS SHALL BE SEALED.
2. SEALS SHALL BE ONE-PIECE RUBBER WITH STAINLESS STEEL BANDS.
3. END SEALS SHALL BE MOLDED TO FIT THE CASING PIPE AND CARRIER PIPE.
4. ADVANCED PRODUCT AND SYSTEMS, MODEL #AC OR CITY OF LONGVIEW APPROVED EQUAL.

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CROSSINGS INSTALLED BY BORING NOTES:

A. PERFORM THE BORING FROM THE LOW OR DOWNSTREAM END UNLESS SPECIFIED OTHERWISE.

1. THE CASING BORE SHALL BE DONE BY AUGER TYPE BORING METHOD. THE CASING BORE SHALL NOT BE DONE BY DIRECTIONAL DRILLING UNLESS APPROVED BY THE CITY OF LONGVIEW PRIOR TO BIDDING.
2. PLACE EXCAVATED MATERIAL NEAR THE TOP OF THE WORKING PIT AND DISPOSE OF MATERIAL AS REQUIRED.
3. JETTING SHALL NOT BE PERMITTED.

B. IN UNCONSOLIDATED SOIL FORMATIONS, A GEL-FORMING COLLOIDAL DRILLING FLUID CONSISTING OF AT LEAST 10% OF HIGH GRADE CAREFULLY PROCESSED BENTONITE MAY BE USED TO CONSOLIDATE CUTTING OF THE BIT, SEAL THE WALLS OF THE HOLE, AND FURNISH LUBRICATION FOR SUBSEQUENT REMOVAL OF CUTTING AND INSTALLATION OF THE PIPE IMMEDIATELY THEREAFTER.

C. IN LOCATIONS WHERE THE SOIL FORMATION IS OTHER THAN CONSOLIDATED ROCK, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION.

1. THIS REQUIREMENT APPLIES TO ALL BORED HOLES OF 18" OR GREATER IN DIAMETER.
2. FOR SMALLER DIAMETER BORED HOLES, IT IS DESIRABLE THAT THE CASING BE INSTALLED AS THE BORING PROGRESSES, BUT BECAUSE OF DIFFERENCES IN SOIL FORMATIONS, THE TIME FOR INSERTING THE CASING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. IN THE EVENT THAT CAVING SAND OR WATER BEARING MATERIALS ARE ENCOUNTERED, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION REGARDLESS OF THE DIAMETER OF THE BORED HOLE.
4. IN ALL CASES, THE SECURITY AND INTEGRITY OF THE ROADWAY IS THE PRIMARY CONCERN.
5. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR CONTINUED INTEGRITY OF THE STRUCTURE OF THE ROADWAY BEING CROSSED, WHETHER OR NOT A CASING PIPE IS INSERTED SIMULTANEOUSLY WITH THE BORING OPERATION.

CROSSING INSTALLED BY TUNNELING AND JACKING:

A. JACK THE PIPE FROM THE LOW OR DOWNSTREAM END, UNLESS SPECIFIED OTHERWISE.

1. PROVIDE HEAVY-DUTY JACKS SUITABLE FOR FORCING THE PIPE THROUGH THE EMBANKMENT.
2. IN OPERATING JACKS, APPLY EVEN PRESSURE TO THE JACKS USED.
3. PROVIDE A SUITABLE JACKING HEAD AND BRACING BETWEEN JACKS SO THAT PRESSURE WILL BE APPLIED AT THE PIPE IN UNIFORMLY AROUND THE RIND OF THE PIPE.
4. PROVIDE A SUITABLE JACKING FRAME OR BACKSTOP.
5. SET THE PIPE TO BE JACKED ON GUIDES, PROPERLY BRACED TOGETHER, TO SUPPORT THE SECTION OF THE PIPE AND TO DIRECT IT IN THE PROPER LINE AND GRADE.
6. PLACE THE WHOLE JACKING ASSEMBLY SO AS TO LINE UP WITH THE DIRECTION AND GRADE OF THE PIPE.

	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 3 OF 4
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7. IN GENERAL, EXCAVATE EMBANKMENT MATERIAL JUST AHEAD OF THE PIPE AND MATERIAL REMOVED THROUGH THE PIPE.

8. FORCE THE PIPE THROUGH THE EMBANKMENT WITH JACKS INTO THE SPACE PROVIDED.

B. THE EXCAVATION FOR THE UNDERSIDE OF THE PIPE, FOR AT LEAST 1/3 OF THE CIRCUMFERENCE OF THE PIPE, SHALL CONFORM TO THE CONTOUR AND GRADE OF THE PIPE.

1. PROVIDE A CLEARANCE OF NOT MORE THAN 2" FOR THE UPPER HALF OF THE PIPE.

2. THIS CLEARANCE SHALL BE TAPERED OFF TO ZERO AT THE POINT WHERE EXCAVATION CONFORMS TO THE CONTOUR OF THE PIPE.

3. EXTEND THE DISTANCE OF THE EXCAVATION BEYOND THE END OF THE PIPE DEPENDING ON THE CHARACTER OF THE MATERIAL, BUT DO NOT EXCEED 2' IN ANY CASE.

4. DECREASE THE DISTANCE IF THE CHARACTER OF THE MATERIAL BEING EXCAVATED MAKES IT DESIRABLE TO KEEP THE ADVANCE EXCAVATION CLOSER TO THE END OF THE PIPE.

C. IF DESIRED, USE A CUTTING EDGE OF STEEL PLATE AROUND THE HEAD END OF THE PIPE EXTENDING A SHORT DISTANCE BEYOND THE END OF THE PIPE WITH INSIDE ANGLES OR LUGS TO KEEP CUTTING EDGE FROM SLIPPING BACK ONTO PIPE.

D. WHEN JACKING OF PIPE HAS BEGUN, CARRY ON THE OPERATION WITHOUT INTERRUPTION TO PREVENT THE PIPE FROM BECOMING FIRMLY SET IN THE EMBANKMENT.

1. REMOVE AND REPLACE ANY PIPE DAMAGED IN THE JACKING OPERATIONS.

2. THE CONTRACTOR SHALL ABSORB THE ENTIRE EXPENSE.

CROSSING WITH CASING INSTALLED BY OPEN CUT:

A. THIS ARTICLE COVERS THE REQUIREMENTS FOR THE CONSTRUCTION OF CROSSING WHERE PIPE CASING IS REQUIRED FOR INSTALLATION BY THE OPEN CUT METHOD.

B. EXCAVATION, BACKFILL, AND EMBANKMENT OF CASING PIPE SHALL BE AS SPECIFIED.

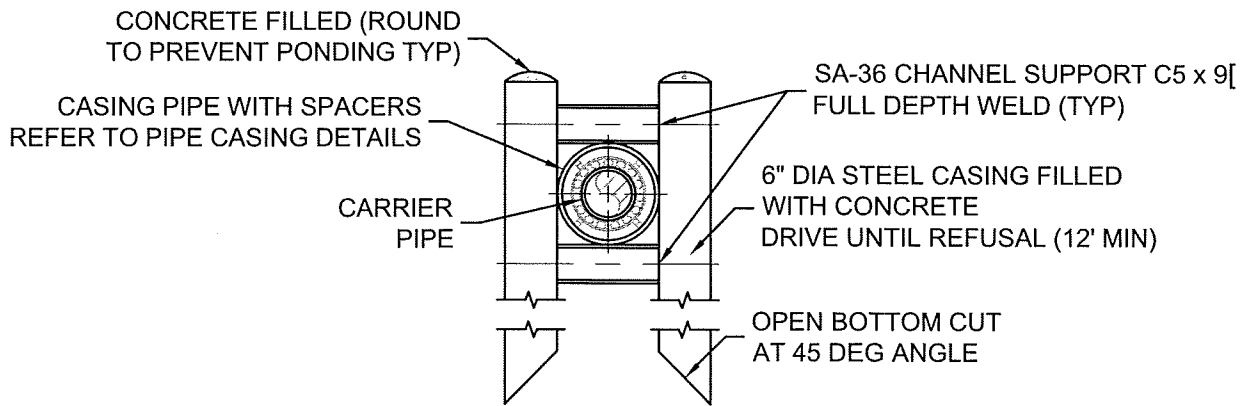
C. CASING SHALL BE BEDDED IN GRAVEL MATERIAL TO THE SPRINGLINE OF THE CASING.

D. CONTRACTOR SHALL BACKFILL WITH SELECT FILL MATERIAL COMPACTED IN 8-INCH LIFTS.

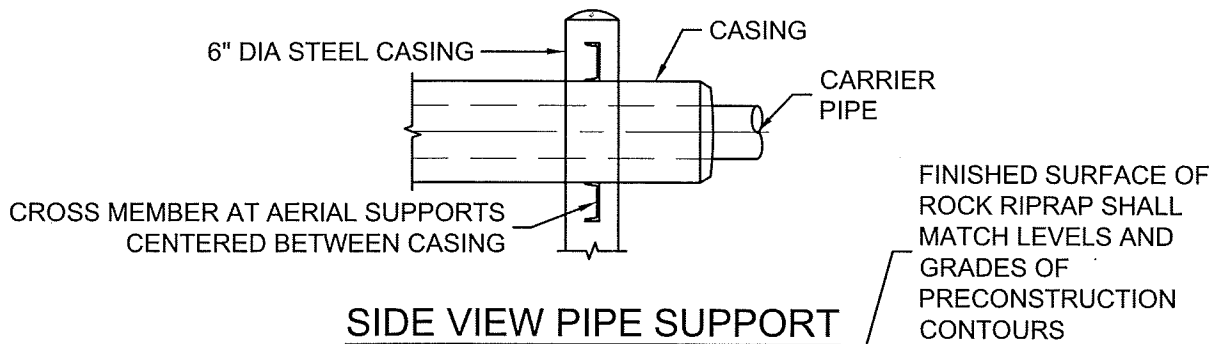
E. CONTRACTOR SHALL COMPLETE THE BACKFILL AND REPAIR THE PAVEMENT SECTION AS SHOWN.

F. IF SETTLEMENT OCCURS, THE PAVEMENTS SHALL BE REMOVED AND THE TRENCH RECOMPACTED AS THE CONTRACTOR'S EXPENSE.

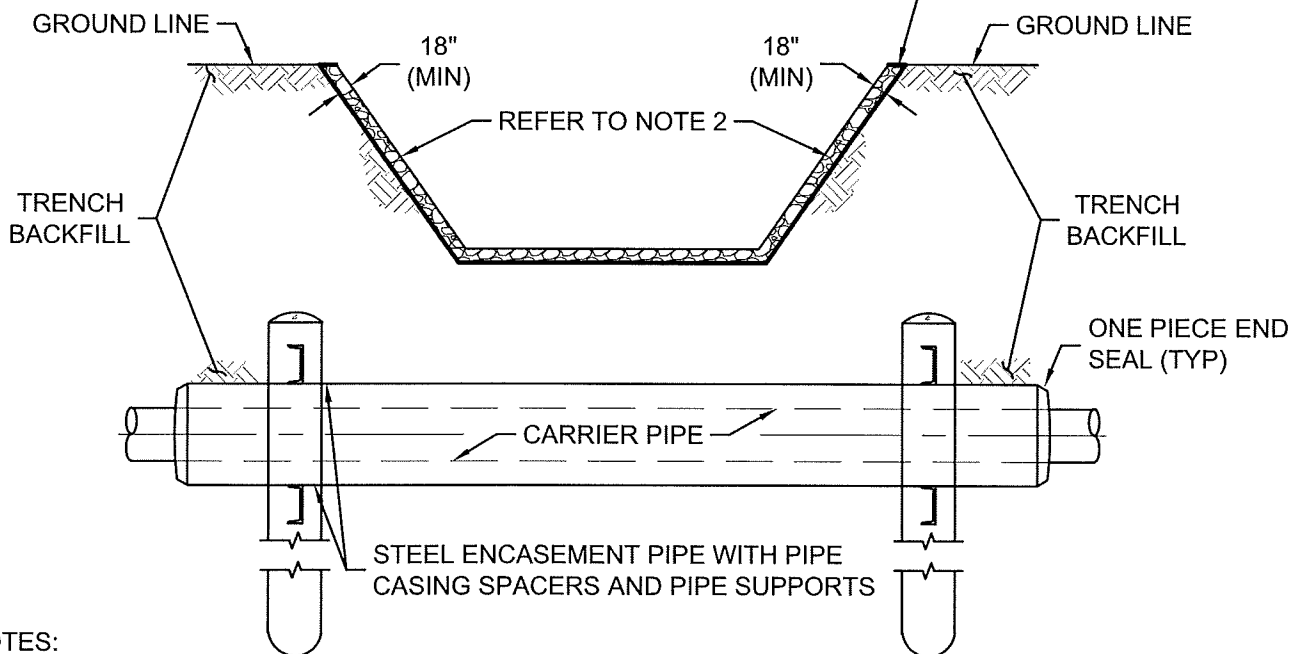
	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 4 OF 4
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**PIPE SUPPORT**



**SIDE VIEW PIPE SUPPORT**

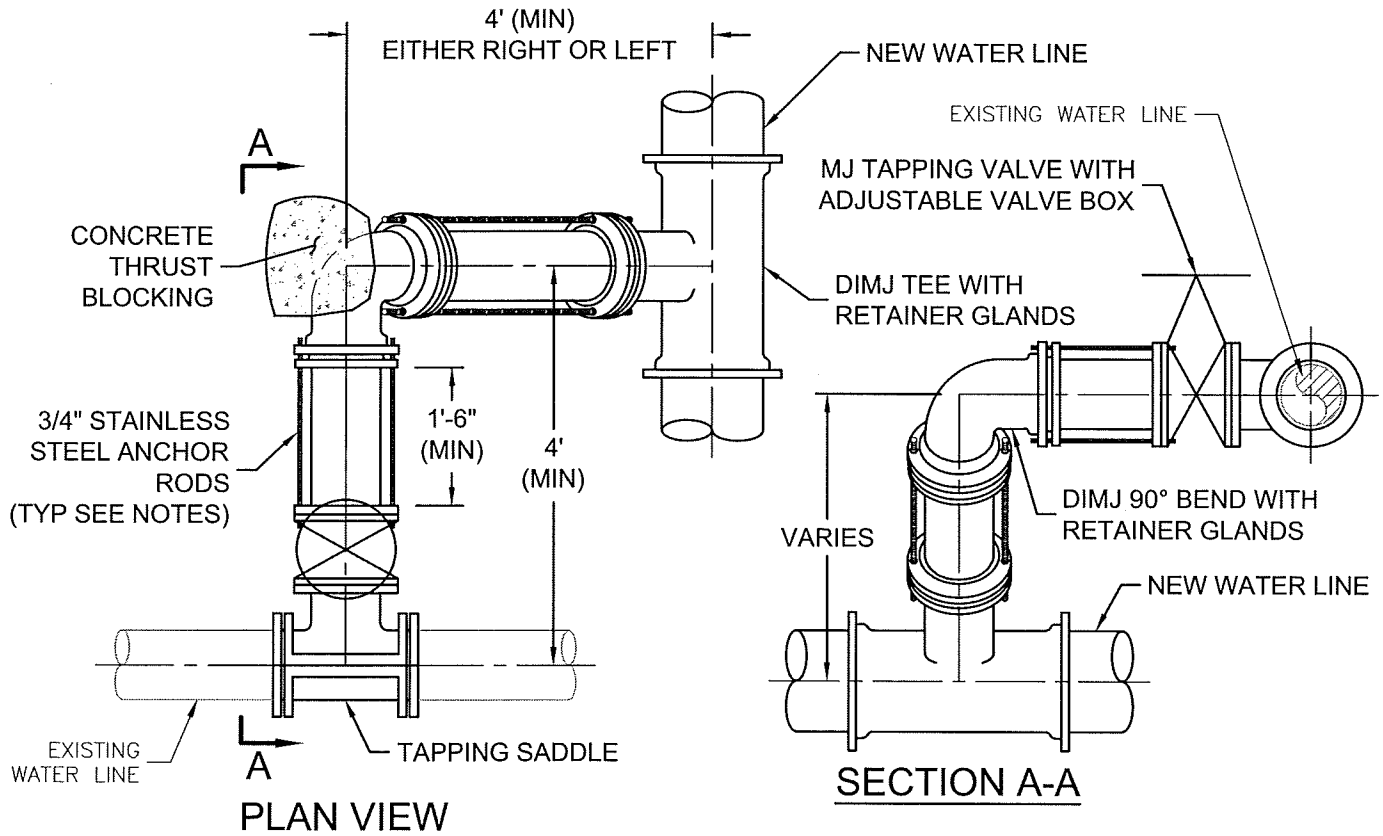


**NOTES:**

1. REFER TO PIPE CASING DETAILS FOR CASING SIZE/MATERIAL, SPACERS, AND END SEALS.
2. INSTALL MIRAFI 700X FILTER FABRIC, OR EQUIVALENT UNDER AND ON SIDES OF PROPOSED STONES. SECURE WITH 9" LONG U-PINS @ 4' OCEW.
3. ROCK RIPRAP - TxDOT ITEM 432, TYPE R MODIFIED TO HAVE ALL STONES BETWEEN 50 AND 150 LBS, AND AT LEAST 50% OF THE STONES GREATER THAN 100 LBS.
4. INSTALL RIPRAP TO OUTSIDE OF TRENCH WIDTH PLUS 3' EITHER SIDE OF TRENCH EXCAVATION.

	<p>WATER</p> <p>LATEST REVISION: 3/20/2018</p>	<p>CITY OF LONGVIEW, TEXAS</p> <p>STANDARD DETAILS</p>	<p>WATERLINE CREEK CROSSING</p>
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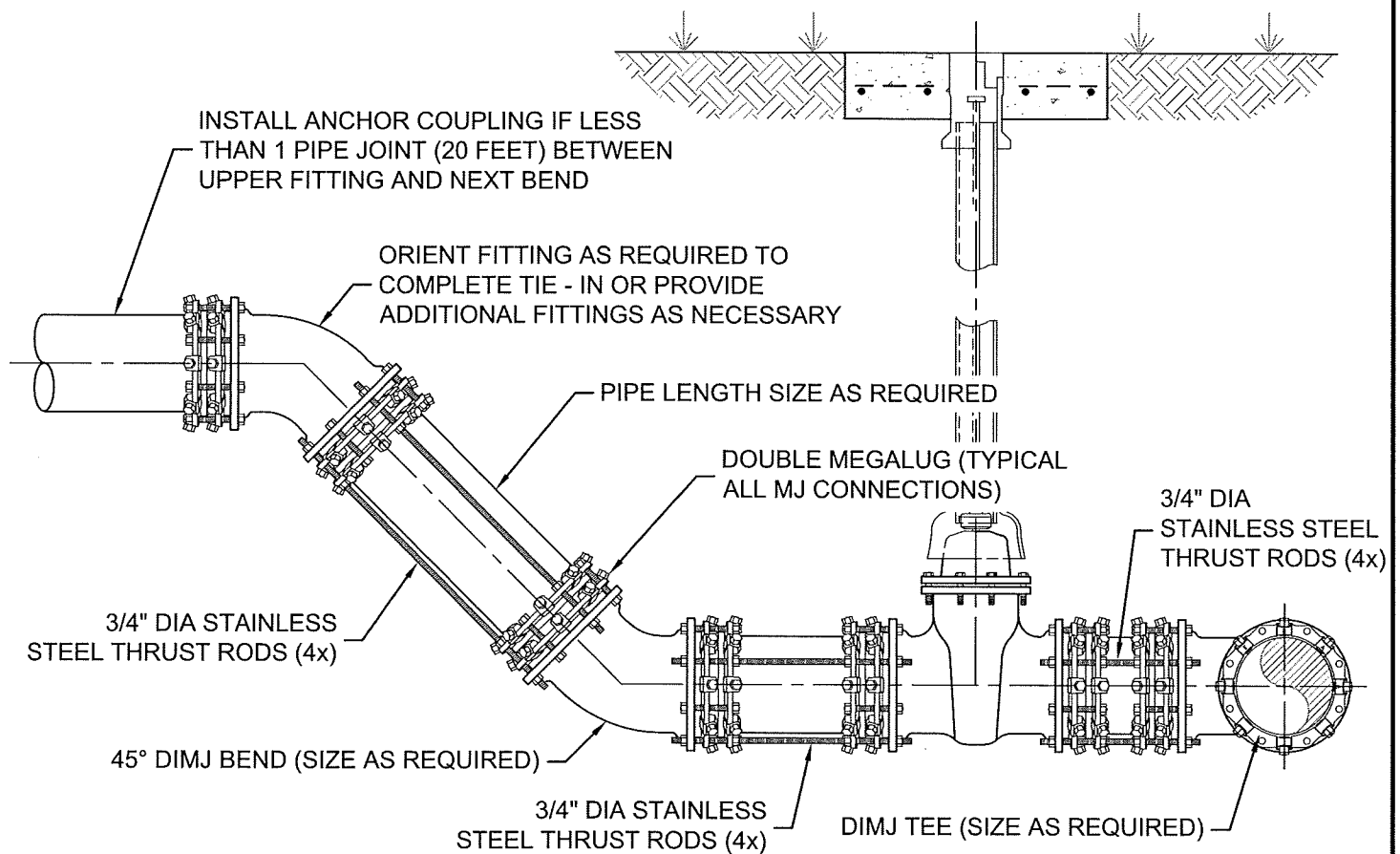


PIPE SIZE	6	8	12	16	18
RODS PER NIPPLE	2	2	4	6	6

**NOTES:**

1. LOCATE EXISTING WATER LINE IN ADVANCE OF LAYING PROPOSED WATER LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW LINE.
2. DIMENSIONS SHOWN ARE RECOMMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS. OTHER DIMENSIONS MAY BE USED.
3. PROVIDE 3/4" STAINLESS STEEL ALL THREAD TIE RODS FOR ANCHORING ALL JOINTS.
4. RODS SHALL BE CUT IN FIELD TO FIT.
5. ROTATE TEE UP AND ELBOW DOWN AS REQUIRED TO MATCH.
6. ANCHOR COUPLINGS MAY BE SUBSTITUTED FOR SPOOL PIPES AND THRUST RODS.
7. TAPPING SADDLE AND VALVE SHALL MEET CITY OF LONGVIEW REQUIREMENTS. TAPPING VALVE SHALL INCLUDE BOX, CONCRETE PAD, BLOCKING, AND APPURTENANCES AS SHOWN ON THE WATER VALVE ASSEMBLY DETAIL.

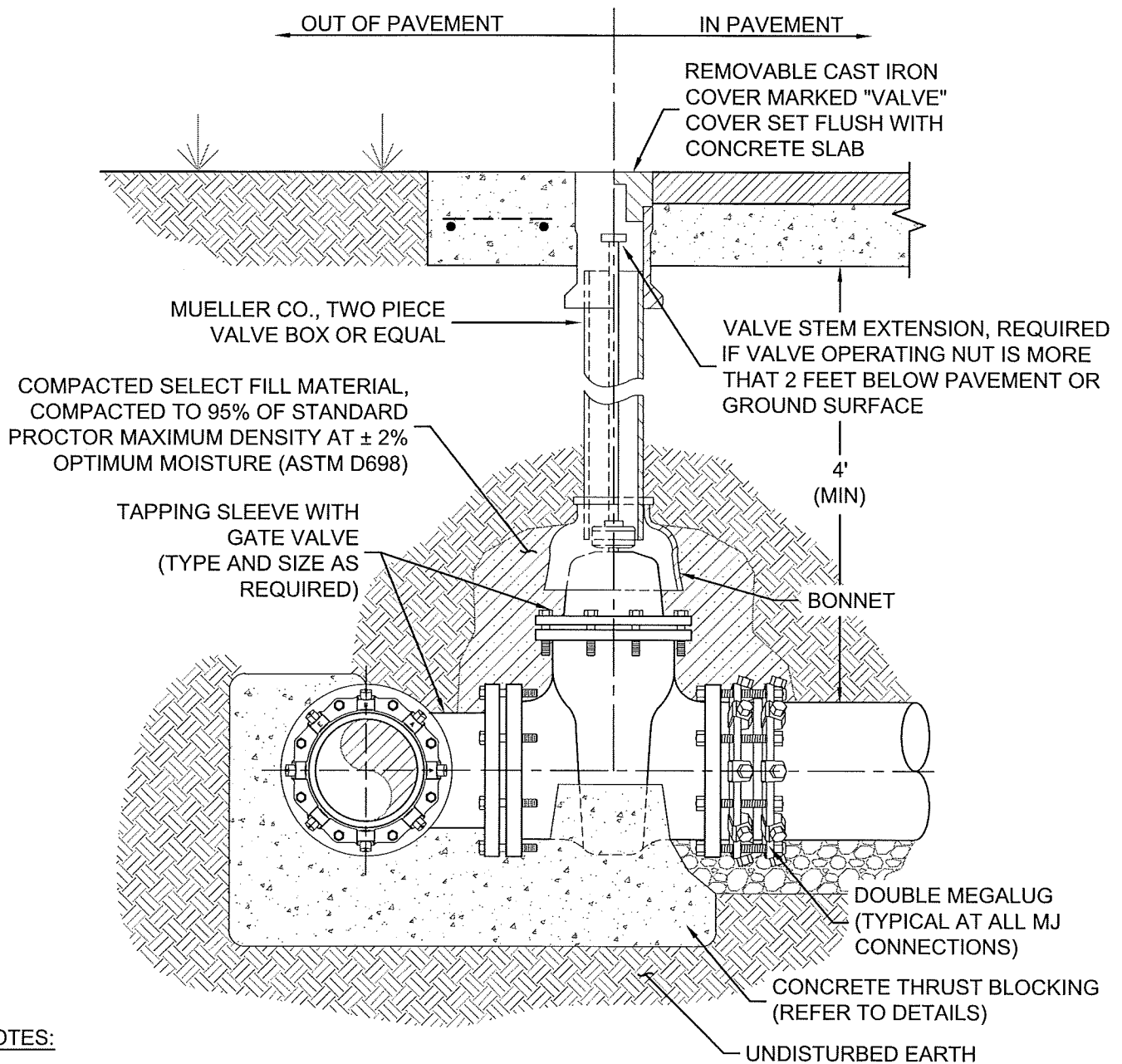
	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE SWING CONNECTION
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#### NOTES:

1. TIE - IN DETAIL WITH DOUBLE MEGALUGS AND ANCHOR RODS REQUIRED AT LOCATIONS WHEN WATER LINE MUST BE PUT IN SERVICE BEFORE CONCRETE BLOCKING CAN REACH 28-DAY COMPRESSIVE STRENGTH.
2. THRUST BLOCKING OMITTED FOR CLARITY. INSTALL CONCRETE THRUST BLOCKING AT ALL VALVES AND FITTINGS.
3. LOCATE VALVE AS CLOSE TO TIE - IN AS POSSIBLE. TIE - IN USING SHORT SPOOL WITH ANCHOR RODS OR ANCHOR COUPLING BETWEEN MJ TEE AND VALVE.
4. PVC PIPE CONNECTIONS SHALL HAVE DOUBLE MEGALUGS WITH ANCHOR RODS. DI PIPE SHALL HAVE RETAINING GLANDS WITH ANCHOR RODS.
5. INSTALL ANCHOR COLLAR AND ANCHOR RODS AT UPPER FITTING IF LESS THAN 1 PIPE JOINT (20 FEET) BETWEEN UPPER FITTING AND NEXT BEND ON LINE.
6. IF AREA UNDER UPPER FITTING IS OVER EXCAVATED, BACKFILL AND COMPACT WITH SELECT FILL TO 95% OF MAXIMUM DENSITY (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE OR AS DIRECTED BY THE CITY OF LONGVIEW.
7. INSTALL CLASS C EMBEDMENT UNLESS OTHERWISE DIRECTED BY THE CITY OF LONGVIEW.

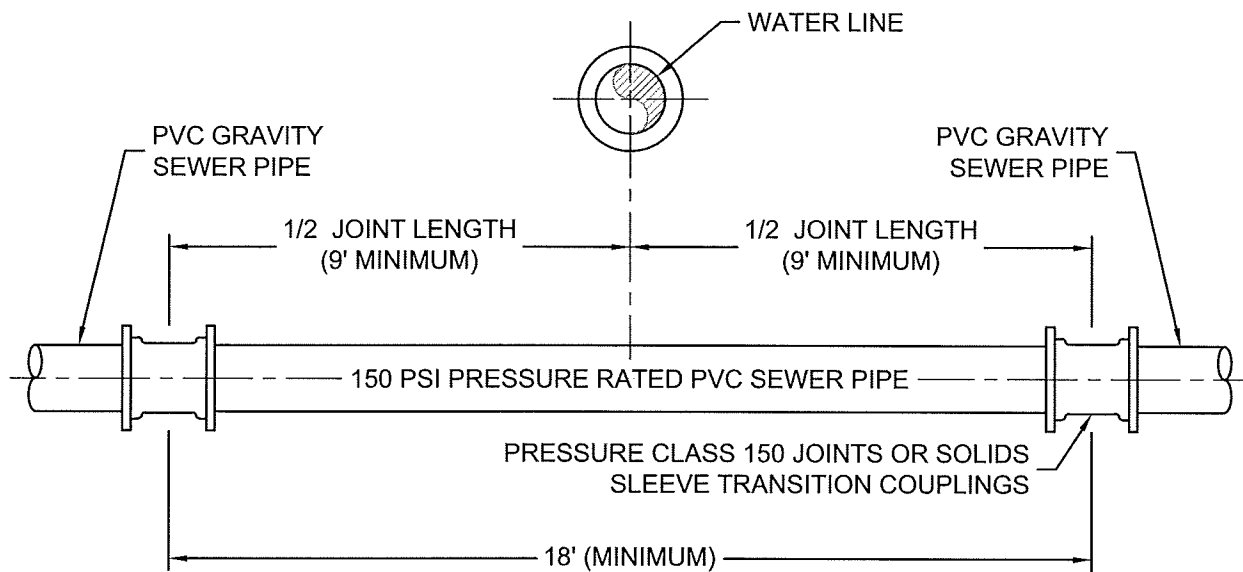
	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE TIE - IN
	LATEST REVISION: 3/20/2018		



**NOTES:**

1. DRAWING PERTAINS TO ALL GATE VALVES SIZES 4" THRU 12".
2. IN UNPAVED AREAS, INSTALL 2' x 2' x 6" CONCRETE VALVE PAD FLUSH WITH TOP OF VALVE BOX, REINFORCE WITH #3 BARS AT 6" OCEW.
3. TAPPING SLEEVES SHALL BE STAINLESS STEEL WITH STAINLESS STEEL NUTS AND BOLTS (SLEEVE MAY BE EPOXY COATED STAINLESS STEEL).
4. FULL DIAMETER DUCTILE IRON TAPPING SLEEVES MAY BE USED IN PLACE OF STAINLESS STEEL.
5. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

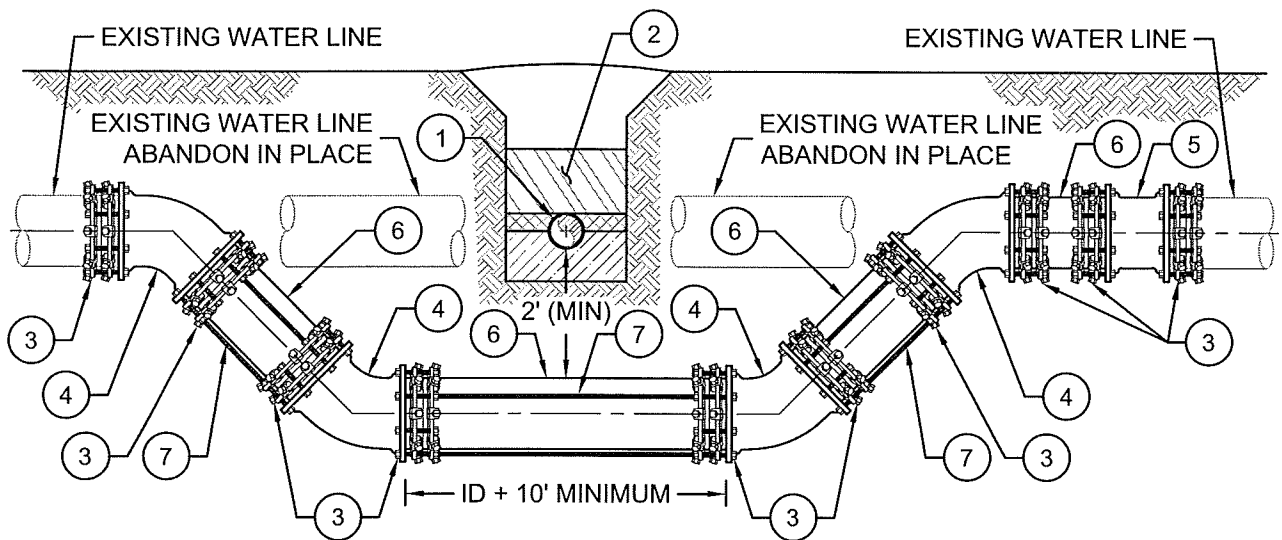
	<p>WATER</p> <p>LATEST REVISION: 3/20/2018</p>	<p>CITY OF LONGVIEW, TEXAS</p> <p>STANDARD DETAILS</p>	<p>WATERLINE TAPPING SLEEVE AND VALVE</p>
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**NOTES:**

1. FOR NEW WATER/SEWER INSTALLATION, THE WATERLINE SHALL BE LOCATED ABOVE THE SEWER LINE.
2. CROSSING PIPES WITHIN 9 FEET, WHERE THE COLLECTION PIPE IS BELOW THE WATERLINE, CONSTRUCT THE COLLECTION LINE USING THE FOLLOWING:
  - a. 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG WITH JOINT CENTERED ON THE CROSSING.
  - b. AT LEAST 6" OF VERTICAL SEPARATION.
  - c. TERMINATING JOINTS DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE.
3. FOR NEW WATERLINE CROSSING EXISTING SEWER, REMOVE EXISTING SEWER LINE AND REPLACE WITH A FULL JOINT OF 150 PSI OR GREATER PRESSURE RATED PVC PIPE. CENTER JOINT AT WATERLINE CROSSING. INSTALL PRESSURE RATED TRANSITIONS.

	WATER  LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER - SEWER CROSSING
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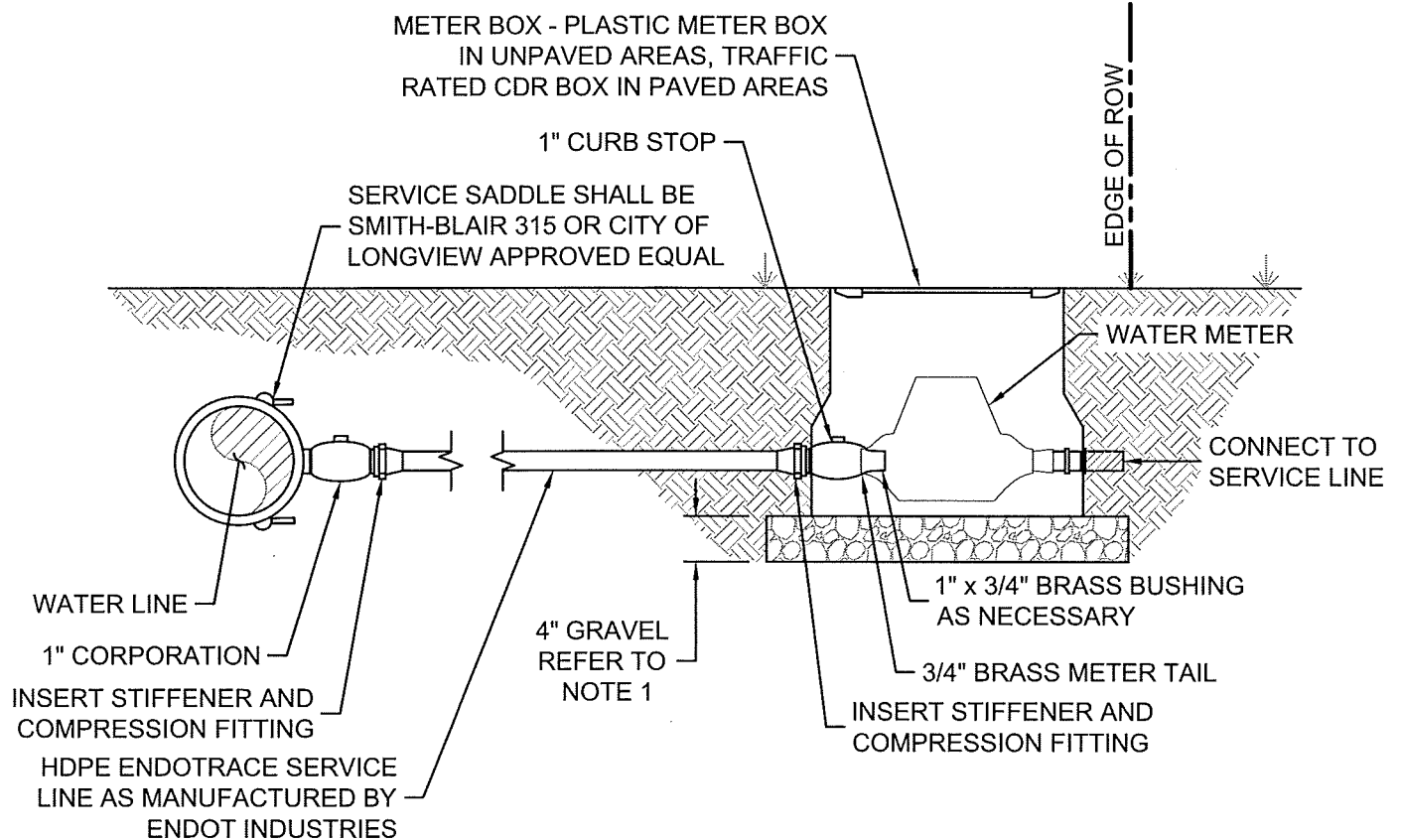


MARK	DESCRIPTION
1	WASTEWATER LINE 20' STEEL CASING OR 20' DI CENTERED ON WATERLINE CROSSING
2	CLASS C EMBEDMENT OR AS DIRECTED BY THE CITY OF LONGVIEW
3	EBBA IRON DOUBLE MEGALUGS
4	45° DIMJ BEND WITH THRUST BLOCKING
5	DIMJ SOLID SLEEVE (SIZE AS REQUIRED)
6	DI PIPE (SIZE AND TYPE AS REQUIRED)
7	3/4" DIA STAINLESS STEEL THRUST RODS (4x)

#### NOTES:

- THRUST BLOCKING OMITTED FOR CLARITY. INSTALL CONCRETE THRUST BLOCKING AT ALL VALVES AND FITTINGS.
- INSTALL FOUR 45° DIMJ BENDS (UNLESS OTHERWISE DIRECTED BY CITY OF LONGVIEW) AND LENGTH OF PIPE NECESSARY TO ACHIEVE MINIMUM CLEARANCE.
- REPLACEMENT PIPE SHALL BE DI, ALL BENDS SHALL BE DIMJ WITH EBBA IRON DOUBLE MEGALUGS OR CITY OF LONGVIEW APPROVED EQUAL.
- INSTALL ANCHOR COUPLING AND ANCHORS RODS AT UPPER FITTINGS IF LESS THE 1 PIPE JOINT (20 FEET) BETWEEN UPPER FITTING AND NEXT BEND.
- PROVIDE 8 MIL POLY WRAP AROUND PIPE AND FITTINGS PRIOR TO INSTALLING CONCRETE ENCASEMENT.
- FOR NEW SEWER LINE, INSTALL ONE SOLID, 20 FOOT JOINT OF DI PIPE IN SEWER LINE CENTERED ON WATERLINE CROSSING. USE PRESSURE RATED COUPLING AT TRANSITIONS FROM EXISTING PIPE TO DI PIPE.
- FOR EXISTING SEWER LINE, REMOVE AND REPLACE SECTION OF EXISTING LINE WITH ONE SOLID, 20 FOOT JOINT OF DI PIPE IN SEWER LINE CENTERED ON WATERLINE CROSSING. USE PRESSURE RATED COUPLINGS AT TRANSITIONS FROM EXISTING PIPE TO DI PIPE.

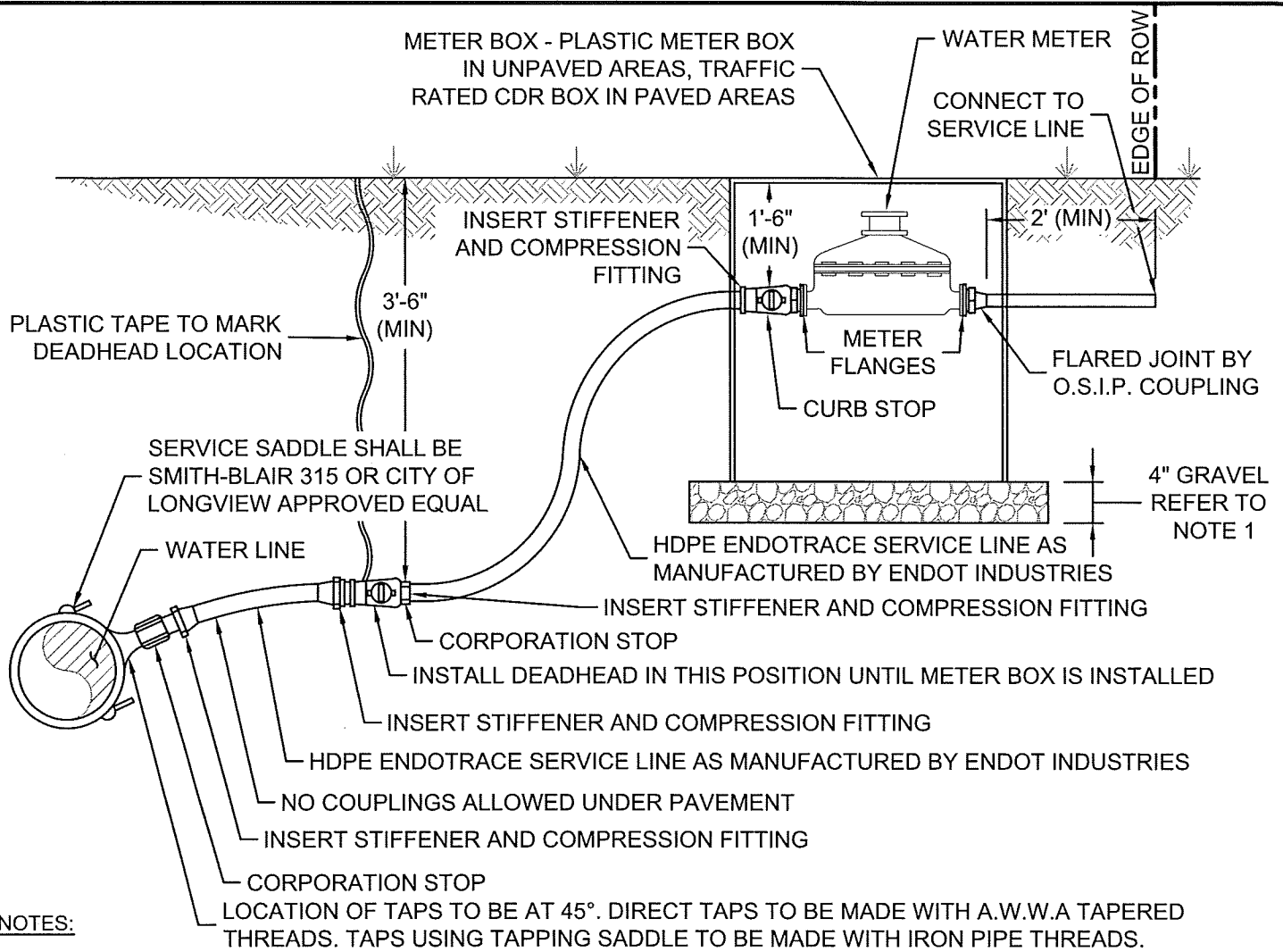
	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER - SEWER CROSSING LOWERING WATERLINE
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#### NOTES:

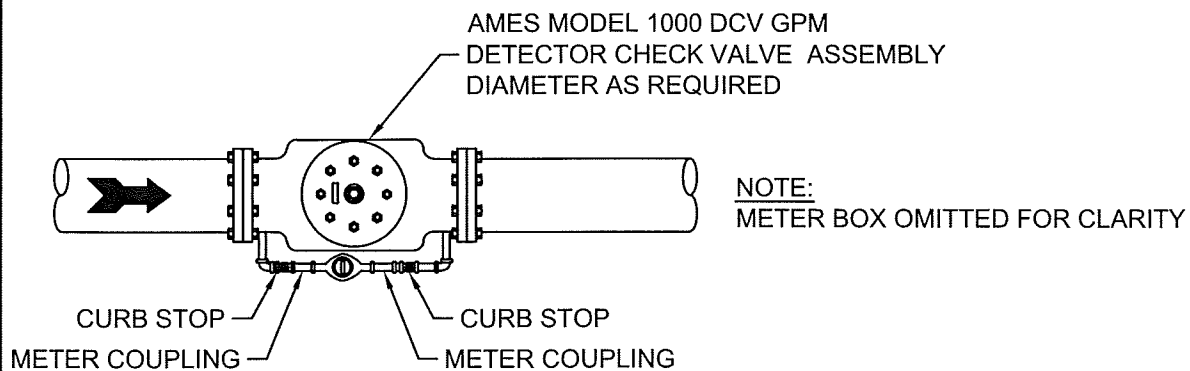
1. 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. ROCK MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
2. METER BOX - FROM CITY OF LONGVIEW APPROVED PRODUCT LIST: PLASTIC METER BOX SHALL BE INSTALLED OUTSIDE OF DRIVEWAYS, SIDEWALKS, OR PAVEMENT. METER BOXES LOCATED IN DRIVEWAYS, SIDEWALKS, OR PAVEMENT SHALL BE PRE-FAB FIBERCRETE BOX WITH COVER AS MANUFACTURED BY CDR (HUBBELL POWER SYSTEMS, INC.) A221118501050 WATER OR CITY OF LONGVIEW APPROVED EQUAL.
3. NEW METER FITTINGS SHALL HAVE FLARED CONNECTIONS.
4. ALL FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C-800. NO-LEAD BRASS SHALL CONTAIN NO MORE THAN ONE FIFTH (0.20% OR LESS) TOTAL LEAD CONTENT BY WEIGHT.
5. ALL MATERIALS, PIPE, TUBING, METER BOX, COVER, AND FITTINGS SHALL BE NEW.
6. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.
7. PERMIT REQUIRED FOR CONNECTION TO EXISTING WATERLINE.
8. WATERLINE TAP SHALL BE MADE BY THE CITY OF LONGVIEW OR APPROVED CONTRACTOR. TAP SHALL BE INSPECTED BY CITY OF LONGVIEW.
9. WATER METER SHALL BE SET BY THE CITY OF LONGVIEW. METER APPLICATION AND FEE REQUIRED. METER SET INSPECTION REQUIRED.

	WATER  LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER SERVICE 1-IN
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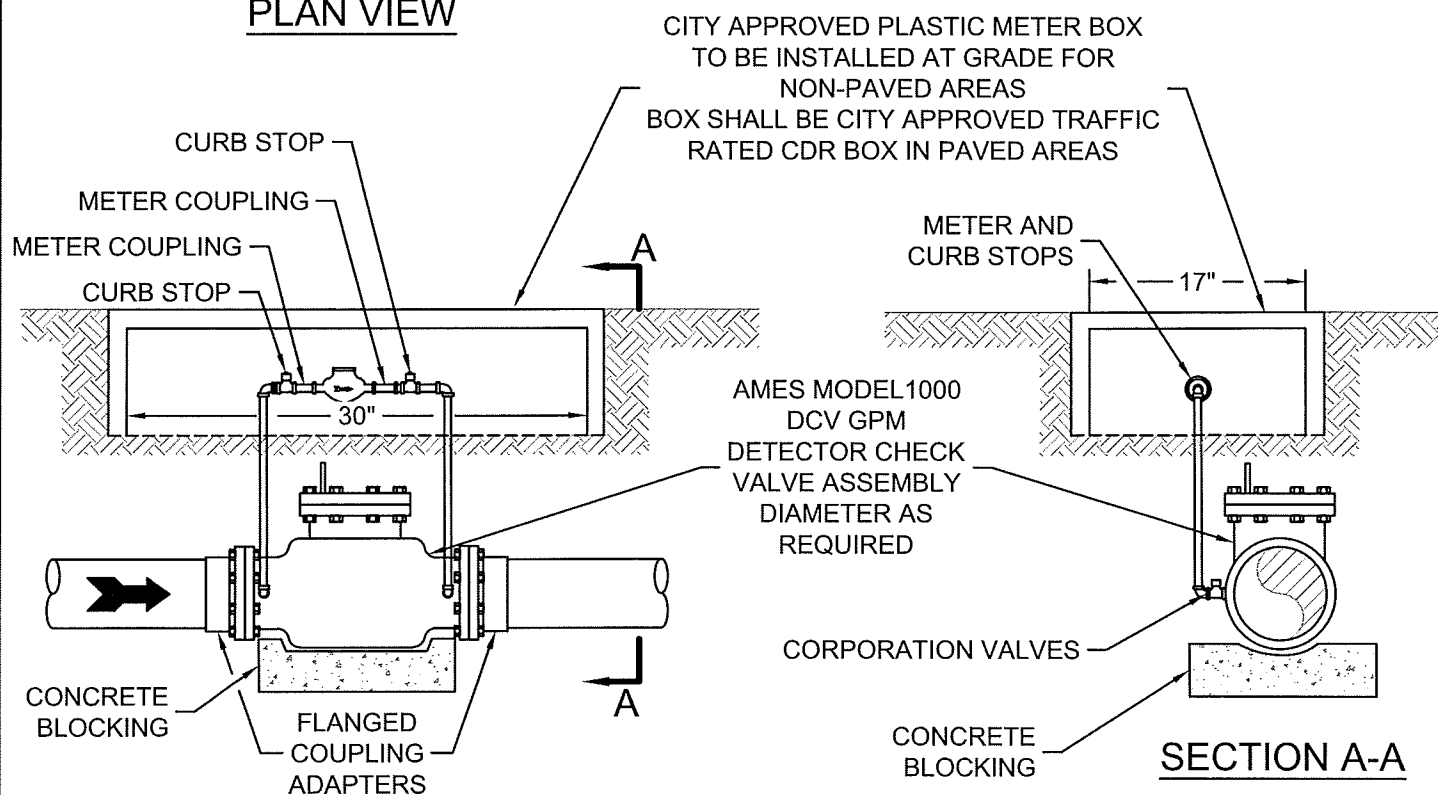


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	WATER  LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER SERVICE 1.5-IN OR 2-IN
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PLAN VIEW



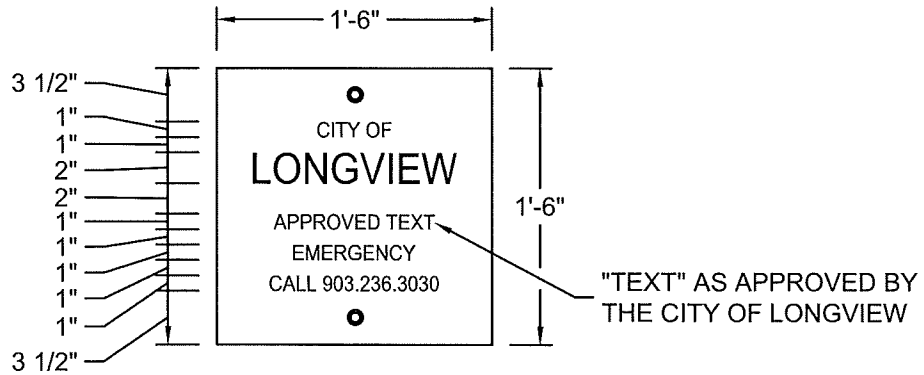
ELEVATION VIEW

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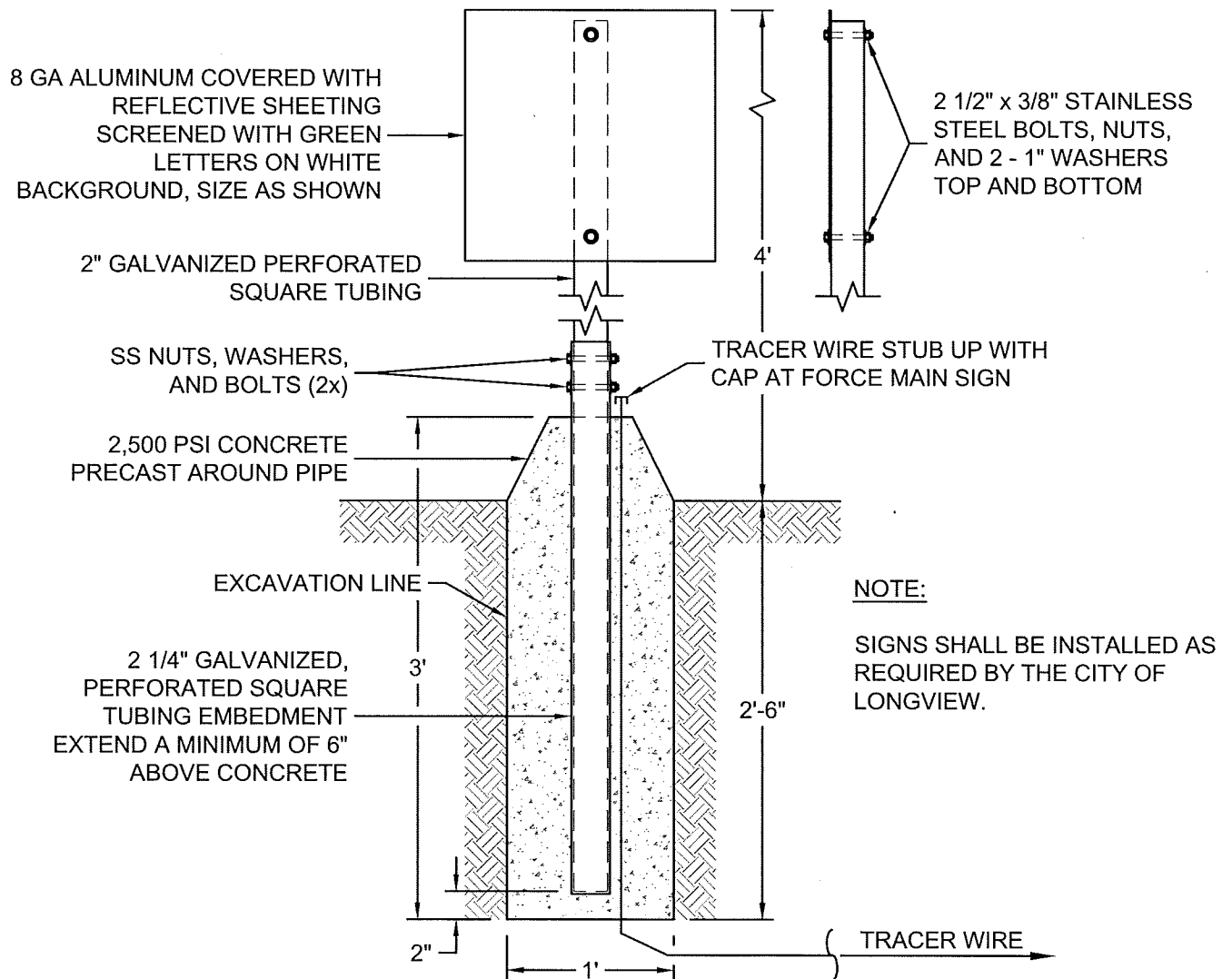
ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

	<p>WATER</p> <p>LATEST REVISION: 3/20/2018</p>	<p>CITY OF LONGVIEW, TEXAS STANDARD DETAILS</p>	<p>FIRE LINE DETECTOR CHECK VALVE ASSEMBLY</p>
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## MARKER SIGN LAYOUT



WATER

LATEST  
REVISION:  
3/20/2018

CITY OF LONGVIEW, TEXAS  
STANDARD DETAILS

MARKER SIGN DETAIL